DOCUMENT RESUME

ED 162 742 PS 010 240

AUTHOR	Parke, Ross D.; Sawin, Douglas B.
TITLE	The Family in Early Infancy: Social Interactional and Attitudinal Analyses.
SPONS AGENCY	Grant Foundation, New York, N.Y.; National Inst. of Mental Health (DHEW), Rockville, Md.
PUB DATE	Mar 77
GRANT	MH-26701-01
NOTE	38p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (New Orleans, Louisiana, March 17-20, 1977)
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS	Affective Behavior; *Family (Sociological Unit); Family Characteristics; Fathers; Infant Behavior; *Infants; *Interaction Process Analysis; *Longitudinal Studies; Mothers; Parent Attitudes; *Parent Child Relationship; Parent Participation; Sex Differences; Social Relations

ABSTRACT

This short term longitudinal study of parent-infant interactions over 4 months beginning at birth examines interrelations among patterns of interactive behavior, characteristics of the parents and infants, and parental attitudes, knowledge and feelings in relation to their infants. Forty sets of mothers and fathers were observed interacting with their infants in a feeding and play context in the newborn period in a hospital setting, at three weeks and at three months in a home setting. A 45 item questionnaire was completed by each parent at each time point. Results showed that: (1) both parents and infants regulate each other's behavior beginning as early as the newborn period; (2) fathers are active participants in interaction with their infants over the first several months of infant life; (3) early social interaction is better understood when parents are affirmed as cognitive organisms and are assessed for their attitudes and attributions about infants; (4) sex of the infant is a determinant of early parent-infant interaction; (5) parent behavior in the triadic family context clearly modifies the interaction patterns of both mothers and fathers. (SE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED162742

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

The family in early infancy:

Social interactional and attitudinal analyses

Ross D. Parke

University of Illinois at Champaign - Urbana

and

Douglas B. Sawin

University of Texas at Austin

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Ross D. Parke
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

PS010240

Paper presented in a symposium, The family system: Networks of interactions among mother, father, and infant, F. A. Pederson, Chairperson, meetings of the Society for Research in Child Development, New Orleans, March, 1977. Support for this project was provided by a grant from the Grant Foundation to Ross D. Parke, and by a grant from the National Institute of Mental Health (Small Grant, MH 26701-01) to Douglas B. Sawin.

Fathers are no longer forgotten. Nor are they hiding in Buenas Aires! Rather, Margaret Mead's claim that fathers are a biological necessity but a social accident is no longer valid (Parke & Sawin, 1976, 1977).

Our own research program has focused on the father's role in early infancy and represents a descriptive attempt to delineate the behavior patterns of fathers and their infants (Parke & Sawin, 1975; Sawin & Parke, 1975). Mothers are employed as well--but for us, mothers are a control group.

In these earlier studies on parental roles in the newborn period, we focused on comparisons of fathers' and mothers' behavior in interactions with their neonates in a feeding context (Parke & O'Leary, 1975; Parke & Sawin, 1975, 1977). Based on frequencies and durations of caregiving and affection giving behaviors we have noted only a few differences which indicate a role differentiation between mothers and fathers during the first days of infant life. Further, assessments of parental responsiveness to infant cues have indicated that fathers and mothers are equally competent in meeting infant needs during feeding (Parke & Sawin, 1975).

The implication of these findings are that fathers appear to have the basic competence to be effective contributors to infant care and that fathers' involvement in these activities can, and perhaps ought to be, an integral component of the infant's <u>early</u> social environment (Parke & Sawin, 1976, 1977; Sawin & Parke, 1976). However these findings are only a beginning toward a comprehensive understanding of the father's role in the infant's <u>enduring</u> social environment. First, generalizability of these findings for early paternal behavior across contexts and time are limited since the data were obtained only during feeding sessions in a hospital context and only duing the first three days of infant life. Secondly, we had not assessed parental perceptions, cognitions, knowledge, values and attitudes about infants and parenting and the role of these cognitions in the interactive processes among family members (Parke, 1977).

The main assumptions underlying our current work can be easily summarized. First, we assume that fathers as well as mothers play an important role in early infancy. Second, we assume that important information can be gained about the development of parent-infant interaction by beginning our observations in the hospital and then continuing them in the home. Not only are there developmental shifts in parent-infant interaction patterns that need to be detailed, but other evidence (Klaus & Kennel, 1976; Lind, 1974) suggests that the early opportunities for interaction may shape later patterns of interaction.

Under the influence of attachment theory, the focus of much prior research has been on the post six months age period, since it was assumed that the infant could only form an attachment with the parent after the achievement of object permanence. However, we recognize that for parents, it is hardly necessary for the parent to wait six months to achieve 'object permanence.' (Parents are getting younger, that is true, but let's not be Ripleyesque about these things). Therefore, the problem becomes redefined as the way in which parents--fathers and mothers--adjust and adapt to their new infant, and the role of the infant in this process. In addition, by focusing on the pre-attachment phase, some clues concerning the determinants of infant attachment may be forthcoming.

Moreover, by explicitly recognizing the parent as a thinking organism, it becomes clear that studies of parent-infant interaction must consider the impact of parental cognitions, perceptions, attitudes and knowledge on the interactive process. Implicit in many previous models of interaction is the assumption that the parent reacts to the behavior of the infant in a mechanical or unthinking fashion. This is, in large measure, a legacy of our S-R heritage which has led us to ignore the role of subjective events in an effort to develop an objective analysis of interaction patterns.

Nor has the recent trend of replacing our S-R language with the assumptions of a biologically derived ethological approach resulted in any correction of

this denial of cognitive factors in social interaction. Another explanation to our failure to consider parent's cognitions may be that in our enthusiasm to give the infant his proper recognition as a contributor to the interactive process, we have over-simplified our assumptions concerning the partner's relative capacities in the dyadic exchange by treating them as co-acting equals. Unfortunately, the implicit assumption may have inadvertently slipped in that the cognitive capacities of the infant and parent could be treated as functionally similar. Although no one would seriously support such a view, we have in fact been treating the parent as a black box reactor in the parent-infant interaction context. This failure to treat parents as information-processing organisms is particularly surprising in light of the general cognitive revival within psychology in the past 15 years.

One other reason for the limited consideration of cognition variables in current theoretical conceptualizations of parent-infant interaction is the failure to adequately distinguish between parental reports as objective measures of parental behavior and parental reports as indices of parental knowledge, attitudes, stereotypes and perceptions. These latter classes of variables are legitimate and important sources of data in their own right and are not easily derivable from observation alone. These types of parental reports provide information about ways in which parents perceive, organize and understand both their infants and their roles as parents. The assumption is that these cognitive sets serve as filters through which the objective behaviors of the infant are processed. It is not assumed that parent perceptions of infant behavior are short-hand routes to circumvent the task of directly observing the infant. Rather it is assumed these perceptions, attitudes and values are different and to some degree independent sources of data. In fact, it is probably a mistake to assume that actual and perceived behaviors are necessarily similar and can be treated as isomorphic sources of information (Tulkin & Cohler, 1973).

Another assumption in our current work concerns the mutual regulatory nature of the parent-infant interaction process. The earlier phases of unidirectional models, whereby we focused only on the parent's impact on the infant is finally behind us (Lewis & Rosenblum, 1974). However, in our enthusiasm to correct an historical imbalance, we focused on the infant's impact on the parent instead of the more appropriate focus on the reciprocal nature of the interactive process. The current zeitgeist, however, has clearly shifted to a study of reciprocity in interaction. The ways in which parents and infants mutually regulate each other are of central interest.

The purpose of this paper is to deal with these issues by presenting preliminary findings from a recently completed short term longitudinal study of parent-infant interactions over four months beginning at birth. The focus of the paper is on the interrelations among patterns of behavior in parent-infant interactions, characteristics of the parents and infants, and parents' attitudes, knowledge, and feelings about the baby.

In approaching these issues we have adopted a model of the triadic family unit as a system of reciprocal and interacting influences which change over time and which are important parameters of each members role in the family and of the infant's development. Not only does this system consist of the three interacting members, but each member brings a set of components to the system--components such as behavioral styles in interactions, past experience and learning, characterisitcs such as age, sex, and a variety of individual differences. For the parents, additional factors such as role attitudes, values, knowledge about infants, and feelings about the infant are also considered.

To extend our earlier hospital observations (Parke, O'Leary, & West, 1972; Parke & Sawin, 1975) to later time points in the home setting was the primary aim of the investigation. Parents were observed at three time points: (A) hospital setting (B) home setting at three weeks (C) home setting at three-four

months. At each time point, observations of mother-infant and father-infant interactions were made while the parent bottle-fed the infant for a 10-minute period and played with the infant with a toy for 5 minutes. Forty infants and their mothers and fathers participated in the study. The sample was drawn from two large metropolitan hospitals which serve a middle-class population. The infant sample consisted of 20 girls and 20 boys; half of each sex were first-born infants and half were later-born infants. Apgar scores for all infants were eight and aobve at one minute; all infants were bottle-fed. In addition, to investigate our cognitive-mediational model of early parent-infant interaction, a 45 item attitude questionnaire was completed by each parent at each time point.

Results

Frequency and duration of parent behaviors with infants.

The frequencies and durations of the parents' behaviors in interaction with their infants will be presented for four classes of parenting activities: 1) visual attending (e.g., parent looks at the infant; parent looks intensely or more closely at the infant); 2) routine care and grooming [e.g., (a.) routine caregiving--parent checks diapers, adjusts bunting or clothing, combs or brushes hair; (b.) wipes the baby's face or hands]; 3) affection giving (e.g., parent holds baby close/snugly; parent smiles; parent kisses baby)]; and 4) stimulation [e.g., (a.) tactual-kinesthetic--parent touches or moves part of baby; (b.) visual--parent mimics the baby's facila expressions; shows the baby a toy; (c.) auditory--parent vocalizes/talks to the baby, parent jiggles or rattles toy to make sounds for the baby]. The frequencies and durations for each of the parent behaviors during the feeding sessions and during the play sessions were submitted to 2 x 2 x 2 x 3 analyses of variance to assess the effects due to parent gender, infant gender, ordinal position of infant (first-born vs. later-borns), and time (hospital, three weeks, three months).

Four issues will be explored from the findings of these analyses. First, we will examine differences between mothers and fathers which were stable over time, infant gender, and infant ordinal position, and which thus suggest consistent role differentiation and characteristic parenting styles for mothers and fathers. Secondly, we will examine the differences between mothers' and fathers' behaviors in interaction with their infants which are attributable to the modifying influences of the infant's gender and ordinal position. Thirdly, we will look at the general changes over time in parenting practices which are similar for mothers and fathers and which suggest the influence of practice and infant development on parenting behavior. And, finally, we will examine differences between mothers and fathers in the ways their behavior changes over time and thus the ways their parenting roles differentially shift and evolve as the parents have more experience with each other and with their infant.

Overview. In general, the similarities and differences in patterns of parenting between mothers and fathers that we have observed in earlier studies were evident in the hospital observations of the present study. However, the inclusion of the play sessions and the longitudinal assessments in this study confirm our predictions that factors associated with context and with time over the first few months are important determinants of evolving patterns of parent-infant interactions and of the development of characteristic styles of parenting. First, there are a number of shifts in the frequency and durations of parenting behaviors over time that are similar for both mothers and fathers. Secondly, there are also a number of differences between mothers and fathers that hold across time. Thirdly, infant gender plays a more important role in accounting for parent differences than our earlier findings have indicated whereas infant ordinal position appears to be a less important determinant of mother-father differences previously observed in the perinatal

period. And, finally, differences between mothers and fathers show significant shifts over time which are characterized by role reversals and role convergence and which suggest the operation of reciprocal influences of mothers and fathers on each other over time, experience, and infant development.

Changing patterns of parenting over time: Similarities between mothers and fathers. First, the changes over time in parenting behaviors that are similar for mothers and fathers will be examined. Main effects for the time factor indicate that parents of young infants engage in less routine care and grooming as the infant grows older. Both the frequency of routine caretaking during feeding ($F(2,72) = 10.61$; $p < .01$; $\bar{x} = 1.74$, .75, and .68) and the frequency of this behavior during the play sessions decreased across time ($F(2,72) = 9.84$; $p < .01$; $\bar{x} = .89$, .30 and .34). Similarly, the frequency of parents wiping their infant's face and hands decreased from birth to three months ($F(2,72) = 1.14$; $p < .001$; $\bar{x} = 4.49$, 2.85, and 2.18).

Affectionate behavior by parents toward their infants showed similar decreases over time for the parent variable "holds close", ($F(2,72) = 43.32$; $p < .01$; $\bar{x} = 2.18$, 1.60, and .65), but not for smiling and kissing. Visual attending and stimulation behaviors on the part of parents show no consistent increases or decreases over time that are the same for both parents; rather, these classes of parenting behaviors were characterized by differences between mothers and fathers that were a function of infant gender and experience over time.

To summarize the main effects indicating consistent changes in parents' behavior over time, our data indicate that while parents spend less time giving routine care to their infants and less time holding them close and snugly as the infants mature, they show stable levels of affection in the form of kissing and smiling. In addition, parents are attentive and provide stable levels of stimulation for their growing infant over the first three months.

Differences between mothers and fathers. There were also differences between mothers and fathers which held over time as indicated by main effects for the parent gender factor. As in our earlier studies, these differences are few and are similar to the parent differences that we have reported from observations made only in the perinatal hospital setting (Parke & O'Leary, 1976; Parke & Sawin, 1975). Mothers spent more time in routine caregiving (checks/changes diaper, dresses, grooms, covers) with their infants than fathers (frequency: $F(1,36) = 5.33$; $p < .03$; duration: $F(1,36) = 2.93$; $.05 < p < .10$). In another parent difference which favored mothers, kissing the baby was more frequent in the feeding context ($F(1,36) = 6.08$; $p < .02$; $\bar{x}_m = .80$ vs $\bar{x}_f = .25$) for mothers than for fathers. The single main effect which favored fathers was more frequent visual stimulation in the form of mimicing the infant's facial expressions ($F(1,36) = 6.07$; $p < .02$; $\bar{x}_f = .26$ vs $\bar{x}_m = .08$). Thus, as in our earlier studies, we again see some evidence for role differentiation between parents with mothers engaging in more routine caretaking (and kissing the baby more often), and fathers engaging in more social stimulation.

Sex of infant as a determinant of differences between fathers and mothers. More frequent than main effects for parent gender, were interaction effects of this factor with the infant gender. These interaction effects indicate that infant gender plays a differential modifying influence of mothers' and fathers' patterns of interacting with their infants. Further, parent roles, defined by the activities they engage in with their infants during feeding times and play times, are differentiated by infant gender in a complementary way: fathers play a different role with sons than with daughters while mothers play the reciprocal role to the fathers' with daughters and sons.

First, there were no consistent parent differences associated with infant gender for routine care and grooming, however for affection giving behaviors

we found that mothers held their sons close and snugly more frequently and for longer periods during play than they did their daughters ($F(1,36) = 5.17$; $p < .03$). Fathers tended to hold their daughters close to them more than their sons (Table 1).

In contrast, for visual attending and stimulation behaviors, fathers consistently favored their sons and mothers more often favored their daughters. As Table 2 shows, fathers spent less time looking at their daughters than they did at their sons ($F(1,36) = 4.10$; $p < .05$) and fathers more frequently looked closely and intently at their sons than at their daughters (See Fig. 1). Fathers also provided more visual and tactual stimulation for their sons. During the play sessions, fathers presented the toy for their sons to look at more frequently than to their daughters ($F(1,36) = 3.96$; $p = .05$) (See Fig. 1), fathers touched and moved their sons' arms, legs and other body parts more than they did their daughters', while mothers showed the reverse pattern, ($F(1,36) = 4.94$; $p < .03$) (Table 3), and during feeding, the fathers made more frequent attempts to stimulate their sons' feeding by moving or jiggling the bottle than they did for their daughters ($F(1,36) = 4.24$; $p < .05$; See Table 4). Mothers, on the other hand, more frequently showed the toy to their daughters, touched and moved their daughters more, and made more attempts to stimulate their feeding. Thus, while there is little differentiation in mothers' and fathers' behavior toward their sons and daughters for routine caregiving behaviors, there are indications that mothers' and fathers' affection giving is more focused on their opposite-sexed infant, while their attending and stimulation behaviors are more frequent with their same-sexed infant in such a way that suggests that mothers and fathers play reciprocal and complementary roles with male and female babies.

Infant ordinal position as a determinant of differences between fathers and mothers. Significant interactions of parent gender and infant ordinal position indicate that infant ordinal position differentially affected fathers and mothers. Fathers smiled less frequently while feeding first-borns than later-borns while mothers smiled more frequently while feeding first-borns, ($F(1,36) = 4.51$; $p < .04$; the means are listed in Table 5). In addition, fathers held first-borns close for shorter periods than later-borns while mothers held first-borns close for longer periods, ($F(1,36) = 4.12$; $p < .05$; the means are listed in Table 6). Conversely, fathers held first-borns far/loose for longer periods than later-borns while mothers held first-borns far/loose for shorter periods, ($F(1,36) = 4.44$; $p < .44$; the means are listed in Table 7).

Differential shifts over time in patterns of mother-infant and father-infant interaction. Our findings indicate that the direction and magnitude of differences between mothers' and fathers' patterns of parenting changed over the early months of infancy. The analyses of the parent behavior yielded a number of interaction effects involving parent gender and the time factor. These interaction effects indicate not only differences between mothers' and fathers' behaviors, but indicate differential shifts in the roles that mothers and fathers play over time that are associated with the type of activity being engaged in (e.g., routine care and affectionate behavior vs. infant stimulation) and the context of parenting. That is, the nature of the shifts in parenting roles tended to be different in feeding and play contexts: role reversals with subsequent role convergence were characteristic of time trends in the play context, whereas role reversals that were maintained over subsequent time were more typical in the feeding context.

An example of convergence of mothers' and fathers' behavior in the play sessions is found for the frequency of smiling (See Table 8). Mothers smiled

somewhat more than fathers in the hospital setting, fathers smiled more than mothers at the three weeks observation, and by three months, the difference between fathers and mothers was the smallest ($F(2,72) = 7.01$; $p < .01$).

Mother and father comparisons for frequency and duration of routine caretaking (e.g., checks diapers, grooms) during the play session at each time point yielded a similar parent gender by time interaction wherein mothers engaged in more caretaking than fathers during the hospital observation, fathers engaged in more caretaking than mothers during the play session at the three week observation, and by the time of the three months observation, fathers and mothers engaged in similar amounts of caretaking during play with their infant (frequency, $F(2,72) = 3.90$; $p < .03$; duration, $F(2,72) = 2.61$; $p < .08$) (See Table 9). Compare this trend with the frequencies of parent wiping the infant's face or hands during the feeding sessions (Table 10). At time one in the hospital, mothers wiped the baby during the feeding more frequently than the fathers. At the second observation of the feeding sessions at three weeks, there was a small difference between fathers and mothers which favored the fathers, and by three months, fathers wiped their infant's face or hands during feeding more frequently than mothers with the difference being greater than at three weeks, ($F(2,72) = 3.23$; $p < .05$).

Thus, for routine care and grooming and for affectionate smiling, mothers and fathers show a tendency to reverse roles between the perinatal period and the third week, with the role reversal being maintained in the feeding context (e.g., "wipes infant") and resulting in a role convergence in the play context (e.g., "routine caretaking" and "smiles") by the third month.

These trends for role reversals and convergences were also evident for stimulation behaviors, though the differences between mothers and fathers were in the opposite direction. As indicated in Table 11, for parents providing tactual-kinesthetic stimulation for the infant in the feeding session, fathers more frequently touched and moved their infant's hands, legs and other limbs in the hospital than did mothers. At the three week feeding observation, mothers touched and moved their infants more than fathers with this difference

increasing over time and being greatest at the three months feeding observation, ($F(2,72) = 3.89$; $p < .03$). Visual stimulation of the infant by the parents during play sessions also showed a parent gender by time interaction, ($F(2,72) = 5.88$; $p < .004$). At the earliest play observation, fathers showed the infant the toy more than the mothers, but by three weeks the mothers were showing the toy to their infants more than fathers and continued to do so during the three months visit, but the mother-father difference at this later time was slightly smaller than the reverse difference at the first (3 day) observation (See Table 12). Finally, parents providing auditory stimulation for their infants during the play session was characterized by the same trend evident in the other stimulation variables, ($F(2,72) = 4.01$; $p < .02$). At time one, fathers more frequently than mothers, jiggled or rattled the toy for their infant to hear, but by time two at three weeks, mothers were providing this auditory stimulation more often than fathers, and at the three months visit, the difference between mothers and fathers was very small (See Table 13).

Thus, viewed together, these parent gender by time interactions reveal two types of trends in shifting roles of mothers and fathers in their interactions with their infants over the first months of infant life. First, the direction of the differences between mothers and fathers was function of the type of parenting activity being engaged in with the time trends indicating a shift from more stereotyped behavior (mothers giving their infants more care and affection than fathers do, and fathers giving more stimulation than mothers do) to the opposite roles or more homogeneous roles by three months.

Second, the nature of the function which defines these different trends was determined by the context of parenting. Role reversals were evident in both feeding and play contexts by three weeks with these reversals being stable into the third month only in the feeding context. In the play context, the

role reversals evident at three weeks were characterized by convergence at three months for all but one of the interactions ("shows toy") obtained from the observations in the play context.

These indications of role reversals and convergence suggest that mutual modeling effects are operating in the family system during the early period of infancy. It appears that, as the parents experience the care, affection and stimulation of their infant together, they are adopting the behaviors of their mates which are reflected in shifts in each other's behavior in the direction that was more characteristic of their mate at an earlier time. Parents learn from each other and, at the same time, provide a model for each other's learning.

Parent and infant responsiveness in dyadic interactions: Sequential analysis findings

Does the infant become more responsive to parental behavior across the first three months of life? And, secondly, does the parent become more responsive to infant cues and signals over this same period? To answer these questions, we employed conditional probability analyses which permit the examination of the changes in the probability of occurrence of infant behavior as a function of the occurrence of a given parent behavior (cf., Sawin, Langlois, & Leitner, 1977). For our purposes, we asked what changes in probability of a particular infant behavior occur in the 10-second interval following a parent behavior or alternatively, whether shifts in parent behavior occur in response to an infant behavior. In other words, if a parent emits a behavior, what happens in the next 10-second interval in terms of the infant's behavior?

A brief methodological note is in order. Since behaviors occur with different frequencies throughout an interaction session, it is necessary to determine the unconditional or baseline probabilities of the occurrence of

the target infant behavior. To do this, the probability that an infant behavior occurred in each of the sixty 10-second intervals of the interaction session was calculated. If there are no sequential dependencies of any infant behaviors with the parent trigger variable, we would expect the infant behaviors to follow the parent trigger behavior (conditional event) in proportion to their unconditional (baseline) occurrence in the total data set.

Two parent modifiers (trigger variables) will illustrate the general pattern of changes. As Figures 2 and 3 show, parental vocalization is a clear modifier of a variety of infant behaviors. In response to parental vocalizations, the infant's attention to the parent increases even in the newborn period as well as at the three weeks and three months period. Second, in response to parental vocalization, there is an increase in infant vocalizing; again, this responsivity to parental auditory stimulation is evident in the newborn period as well as the later time points.

However, there is a general shift in the overall frequency of infant vocalization across the first three months with the infant engaging in more spontaneous (unconditional) vocalization. In contrast, the infant is less likely to exhibit "makes face" (Figure 3) across the first three months spontaneously but is increasingly likely to do so in response to parental vocalization. Finally, the probability of infant smiles increases markedly in response to parental vocalizations; these are shown only for the three months period since the baseline frequency of infant smiles is very low prior to this time point.

Parental smiling behavior--a visual, in contrast to an auditory stimulatory, pattern--is not a consistent elicitor of infant behavior--particularly in the newborn period. As Figures 4 and 5 indicate smiling is actually an effective inhibitor of infant vocalization but, not surprisingly, has no consistent

impact on the infants' attention directed toward the parent. Parental smiling does result in slight increases in infant facial expressions such as "makes face" (Figure 5) at three weeks and more so at three months, but tends to inhibit infant facial expressions in the newborn period. At three months a parent smile increases infant smiling as well. In general, we found that infants respond equally to mother and father auditory and visual stimulation.

Do parents become increasingly responsive to infant cues? As Figures 6 and 7 show, there is a general pattern of increasing responsivity to infant vocalizations across the first three months of life. During the newborn period, most parent behaviors show little responsivity to this particular infant cue. Neither looking more closely, smiling, touching or vocalizing on the part of the parent increase in response to infant behavior during this period; in contrast, there is a slight inhibitory effect on parental behavior. At three weeks and three months, however, parents look more closely, smile, and touch their infants following an infant vocalization. Parent vocalization remains high throughout this three months period, and does not increase in response to infant vocalizing; in fact, parental vocalizations are less likely (i.e., are inhibited) after infant vocalizations, which suggests the early development of conversational patterns in which parents interrupt their high rate of vocalizing to listen to their infant when he or she vocalizes. Closer examination of longer chains of parent-infant vocal dialogues will provide more information about this apparent precurser to "conversation".

Infant movement, however, is a reliable modifier of parental smiling, looking more closely and touching at all three time points (Figures 8 and 9). Parental responsivity to infant movement is highest at three months. Parental vocalizations show the same pattern at three weeks and three months, but not in the newborn period, where there is little relationship between infant movement and parental vocal behavior (Figure 9).

Although these patterns generally hold for both mothers and fathers, sex of parent is an important determinant of reactions to infant smiling. At three months mothers showed a consistently higher rate of response to infant smiles than fathers. Mothers are more likely to smile, vocalize and touch their infants in response to an infant smile than fathers. This is consistent with the general pattern found in our earlier studies: mothers smile at their infants at a higher rate than fathers.

Parent Attitudes

Questionnaire data generally confirmed the pattern of behavioral results. A first factor, parental strain (resentment, disappointment, anxiety/worry) was lowest in the newborn period, increased to higher levels at the three week period and then declined to an intermediate level by three months [$F(2,72) = 7.69$; $p < .05$)]. This factor was composed of items such as: 1) resentment about how long it takes to feed the baby, how demanding babies are, having to give up favorite activities for the baby, how much attention babies require; 2) disappointment about the babies not recognizing the parent, about the baby not behaving like other babies, about how contented and happy the baby is, and about having had the baby at that time in the parents' lives; and finally 3) anxiety and worry about the infant not being active enough, about the strain the infant would place on family finances, and about how difficult it is to calm the baby when he/she is fussy. The pattern of the parents' responses to these parental strain items over the three month period is a reasonable one: the least strain in the hospital context during the first days of infant life where the excitement and joy of the new infant is prevalent and where there is practical and social support from the pediatric nursing and medical staff; greater strain in the early period at home (three weeks) when the realities of a new infant in the family must be confronted; and a leveling off of parental

strain by three months as the family adjusts to the infant; to the impact of the infant on the parents' life style and finances and as the parents' confidence in their parenting skills has developed.

Of greatest relevance to the behavioral observations were two other factors. One factor, the parents' attitudes about affectionate stimulation for the infant, included such items as: frequency of holding the baby; pleasure from holding the baby; enjoyment of infant feeding time; cuddling is good for babies; diapering is a good time to play with the baby; physical features of the infant particularly liked by the parent; and the value of verbal stimulation for the infant's development. On this factor, there was a small difference between mothers and fathers at three days which favored fathers, an even smaller difference between mothers and fathers at three weeks which favored mothers, but by three months, mothers scored significantly higher than fathers on this affection and stimulation cluster of items [$F(2,72) = 10.43$, $p < .01$)]. Whereas mothers' scores were stable between the three day period and the three week period and increased between three weeks and three months, father scores declined between three days and three weeks and remained stable between three weeks and three months. Thus it appears that fathers' attitudes about affectionate stimulation of their infants during the first three months is most positive in the first days in the hospital whereas mothers' attitudes in this regard are most positive during the third month. This is precisely the pattern of findings obtained for mothers' and fathers' behavior for the tactual-kinesthetic affectionate stimulation variable "parent touches/moves part of baby" (See Table 11).

Similar correspondence between patterns of parents' attitudes and behavior over time was observed for the behavior variable "parent shows infant toy to look at" and the attitudinal factor consisting of parental attributions of infant

visual competence and the parents' intentions about use of toys in play with their infant. This factor, parental attitudes about infant visual capabilities, included the items: babies can distinguish the different parts of people's faces; babies can follow a moving object with their eyes; babies are unable to differentiate between people; and parents' plans to use toys to play with the infant. As would be expected, both mothers and fathers attributed greater visual competence to infants with increasing time and age of their infant, but a changing pattern of mother-father differences over time was obtained [$F(2,72) = 3.74$; $p < .05$)]. During the newborn period in the hospital, fathers attributed greater visual competence to their infants than mothers. By three weeks, mothers attributed greater visual competence to their infants and did so at a level higher than fathers, and between three weeks and three months both mothers and fathers attributions of infant visual competence increased with mothers continuing to make greater attributions than fathers. A very similar pattern of mother-father differences and changes over time were found for the mothers and fathers visual stimulation behavior in the parent-infant interactions. For the variable, "shows toy" (See Table 12), fathers did so for more time than mothers at three days, but by three weeks mothers visually stimulated the infant with the toy more than the father and continued to do so during the three months observation. This parallel between shifts in parent attitudes about infants and their behavior in interaction with their infants suggests that parents' attitudes, including feelings about the baby, attributions about infant competence, and knowledge about "what's good for babies", may mediate the behavior observed in parent-infant interactions and their behavioral shifts across time.

Implications and Conclusions

Findings from our sequential analyses provide support for a mutual regulatory model of early parent-infant interaction. Both infant and parents

regulate each other's behavior and our data indicate that this process of mutual regulation begins as early as the newborn period.

Second, our findings indicate that fathers are active participants in interactions with their infants not only in the newborn period, but continue to be active participants in their interactions with their infants over the first several months of infant life.

Third, our findings concerning attitudinal assessments suggests that our understanding of early social interaction may be enhanced by a reaffirmation of parents as cognitive organisms and assessments of their attitudes and attributions about infants.

Fourth, our data underline the importance of infant sex as a determinant of early parent-infant interaction. Differences in father-son and father-daughter relationships seem to have their antecedents very early in infancy. Although, cultural explanations probably provide parsimonious explanations of these early cross-sex effects, the presence of similar sex of parent by sex of offspring interaction patterns in rhesus monkeys (Redican, 1975) raises interesting questions concerning the adequacy of a cultural explanation alone. Perhaps some of the recent speculations of sociobiologists such as Trivers (1972) and Wilson (1975) will aid us in adequately accounting for these sex of infant differences in father involvement.

Finally, our data suggest that no simple model of dyadic interaction in which mother-infant and father-infant interaction are treated indepedently will suffice. As our earlier research (Parke & O'Leary, 1976) has indicated, parent behavior in the triadic family context clearly modifies the interaction patterns of both mothers and fathers. Our current data which suggests a pattern of mutual influence and sharing of both stimulatory and caretaking responsibilities across time indicates that the family triad should receive increased attention.

Fathers, in short, are active participants from early infancy onward. They are neither unnecessary nor forgotten, but active and important figures in the early drama of infant development.

Summary

Mothers and fathers were observed interacting with their infants in a feeding and play context in the newborn period, at three weeks and three months. Systematic shifts in parent-infant interaction occur across the first three months of life. While both mothers and fathers spend less time providing routine care, they show stable levels of affectionate and stimulatory behavior. Generally there was a high degree of similarity between mothers and fathers although mothers spend more time feeding than fathers, while fathers engage in more social stimulation. The infant's gender modified interaction patterns with fathers providing more stimulation for their sons while mothers played a complementary role by providing more stimulation for their daughters. However, there was evidence of shifting roles over the first three months for mothers and fathers. While mothers were more involved in caretaking and fathers were more involved in stimulatory behaviors in the newborn period, these patterns reversed at three weeks and converged at the three months observation. These indications of role and convergence suggest that mutual modeling effects are operating in the family system during the early period of infancy. Questionnaire data paralleled these behavioral observations. Father's perceptions of the infant's need for stimulation and his knowledge of infant perceptual capacities were higher than mothers at the newborn period, while mothers scored equal to or higher than fathers at three weeks and three months. These shifts in attitudes and knowledge of fathers and mothers are similar to the shifts in visual and auditory stimulation provided by fathers and mothers across time: fathers were more active stimulators early while mothers played a more active

stimulatory role at later time points. Finally, sequential analyses of parent-infant interaction patterns indicated that a variety of infant cues such as infant vocalization and movement are significant modifiers of parent behavior. The reciprocal relationship is evident as well, namely that infants become increasingly responsive to parent vocalization and smiling as they mature. Both mothers and fathers are sensitive and responsive to infant cues and effective modifiers of infant behavior. The findings support a model of early parent-infant interaction which stresses the mutual regulatory character of early interaction patterns.

The investigation provides clear evidence that fathers as well as mothers are active and sensitive figures in early social development of infants.

References

Klaus, M.H. & Kennel, J.H. Parent-infant bonding. St. Louis: Masby, 1976.

Lewis, M. & Rosenblum, L.A. (Eds.), The origins of behavior. Vol. I. The effect of the infant on its caregiver. New York: Wiley, 1974.

Lind, R. Observations after delivery of communications between mother-infant-father. Paper presented at The International Congress of Pediatrics. Buenas Aires, October, 1974.

Parke, R.D. Parent-infant interaction: Progress, paradigms, and problems. In G.P. Sackett and H.C. Haywood (Eds.), Application of observational-ethological methods to the study of mental retardation. Baltimore: University Park Press, 1977, in press.

Parke, R.D. & O'Leary, S. Father-mother-infant interaction in the newborn period: Some findings, some observations, and some unresolved issues. M.K. Riegel & J. Meachom (Eds.), The developing individual in a changing world. Vol. II. Social and environment issues. The Hague: Mouton, 1976.

Parke, R.D., O'Leary, S.E., & West, S. Mother-father newborn interaction: Effects of maternal medication, labor and sex of infant. Proceedings of the American Psychological Association, 1972, 85-86.

Parke, R.D. & Sawin, D.B. Infant characteristics and behavior as elicitors of maternal and paternal responsivity in the newborn period. Paper presented at a symposium "Direction of Effects in Studies of Early Parent-Infant Interaction", at Society for Research in Child Development, Denver, April, 1975.

Parke, R.D. & Sawin, D.B. The father's role in infancy: A re-evaluation. The Family Coordinator, 1976, 25, 365-371.

Parke, R.D. & Sawin, D.B. Fathering: It's a major role. Psychology Today, 1977, 11, 108-112.

Parke, R.D. & Sawin D.B. Father-infant interaction in the newborn period: A re-evaluation of some current myths. In E.M. Hetherington and R.D. Parke (Eds.), Contemporary reading in child psychology. New York: McGraw-Hill, 1977.

Redican, W.K. Adult male-infant interactions in nonhuman primates. In M. Lamb (Ed.), The role of the father in child development. New York: Wiley, 1976, pp. 345-385.

Sawin, D.B., Langlois, J., & Leitner, E.F. What do you do after you say hello? Observing, coding, and analyzing parent-infant interactions. Behavior Research Methods and Instrumentation, 1977, 9, 425-428.

Sawin, D.B. & Parke, R.D. Father-infant interaction: Assessment and current status. Paper presented at the Texas Psychological Association Annual Meetings, San Antonio, December, 1975.

Sawin, D.B. & Parke, R.D. Adolescent fathers: Some implications from recent research on paternal roles. Educational Horizons, 1976, 55, 38-43.

Trivers, R.L. Parental investment and sexual selection. In B. Campbell (Ed.), Sexual selection and the descent of man, 1871-1971. 1972, pp. 136-179.

Tulkin, S.R. & Cohler, B.J. Child-rearing attitudes and mother-child interaction in the first year of life. Merrill-Palmer Quarterly, 1973, 19, 95-106.

Wilson, E.O. Sociobiology-The new synthesis. Cambridge, Massachusetts: The Belknap Press, 1975.

TABLE 1

MEANS FOR HOLDS INFANT CLOSE
(Frequency in Play Situation)

		Sex of Infant	
		Male	Female
Parent Gender	Father	.51	.57
	Mother	.78	.52

TABLE 2

MEANS FOR LOOKS AT INFANT
(Duration in Feed Situation)

		Sex of Infant	
		Male	Female
Parent Gender	Father	571.32	553.42
	Mother	567.93	570.27

TABLE 3

MEANS FOR TOUCHES OR MOVES INFANT
(Frequency in Play Situation)

		Sex of Infant	
		Male	Female
Parent Gender	Father	6.67	5.48
	Mother	4.50	7.20

TABLE 4

MEANS FOR STIMULATES INFANT TO FEED
(Freqnency in Feed Situation)

		Sex of Infant	
		Male	Female
Parent Gender	Father	18.65	14.22
	Mother	15.16	17.37

TABLE 5

MEANS FOR SMILES AT INFANT
(Frequency in Feed Situation)

		Infant Ordinal Position	
		Firstborn	Laterborn
Parent Gender	Father	6.63	8.33
	Mother	9.50	7.48

TABLE 6

MEANS FOR HOLDS INFANT CLOSE
(Duration in Play Situation)

		Infant Ordinal Position	
		Firstborn	Laterborn
Parent Gender	Father	77.37	105.30
	Mother	103.52	83.50

TABLE 7

MEANS FOR HOLDS INFANT FAR/LOOSE
(Duration in Play Situation)

		Infant Ordinal Position	
		Firstborn	Laterborn
Parent Gender	Father	167.90	157.52
	Mother	145.18	171.32

TABLE 8

MEANS FOR SMILES AT INFANT
(Frequency in Play Situation)

		Time Point		
		Hospital	3 Weeks	3 Months
Parent Gender	Father	4.20	5.03	4.23
	Mother	5.10	3.65	3.73

TABLE 9

MEANS FOR ROUTINE CARETAKING (DIAPERS, DRESSES, OR GROOMS INFANT)
(Duration in Play Situation)

		Time Point		
		Hospital	3 Weeks	3 Months
Parent Gender	Father	1.58	2.95	.50
	Mother	2.83	.40	.98

TABLE 10

MEANS FOR WIPES INFANT
(Frequency in Feed Situation)

		Time Point		
		Hospital	3 Weeks	3 Months
Parent Gender	Father	3.78	3.15	2.75
	Mother	5.20	2.45	1.62

TABLE 11

MEANS FOR TOUCHES OR MOVES INFANT
(Frequency in Feed Situation)

		Time Point		
		Hospital	3 Weeks	3 Months
Parent Gender	Father	8.10	5.72	7.12
	Mother	6.38	8.00	13.02

TABLE 12

MEANS FOR SHOWS INFANT TOY OR OBJECT
(Duration in Play Situation)

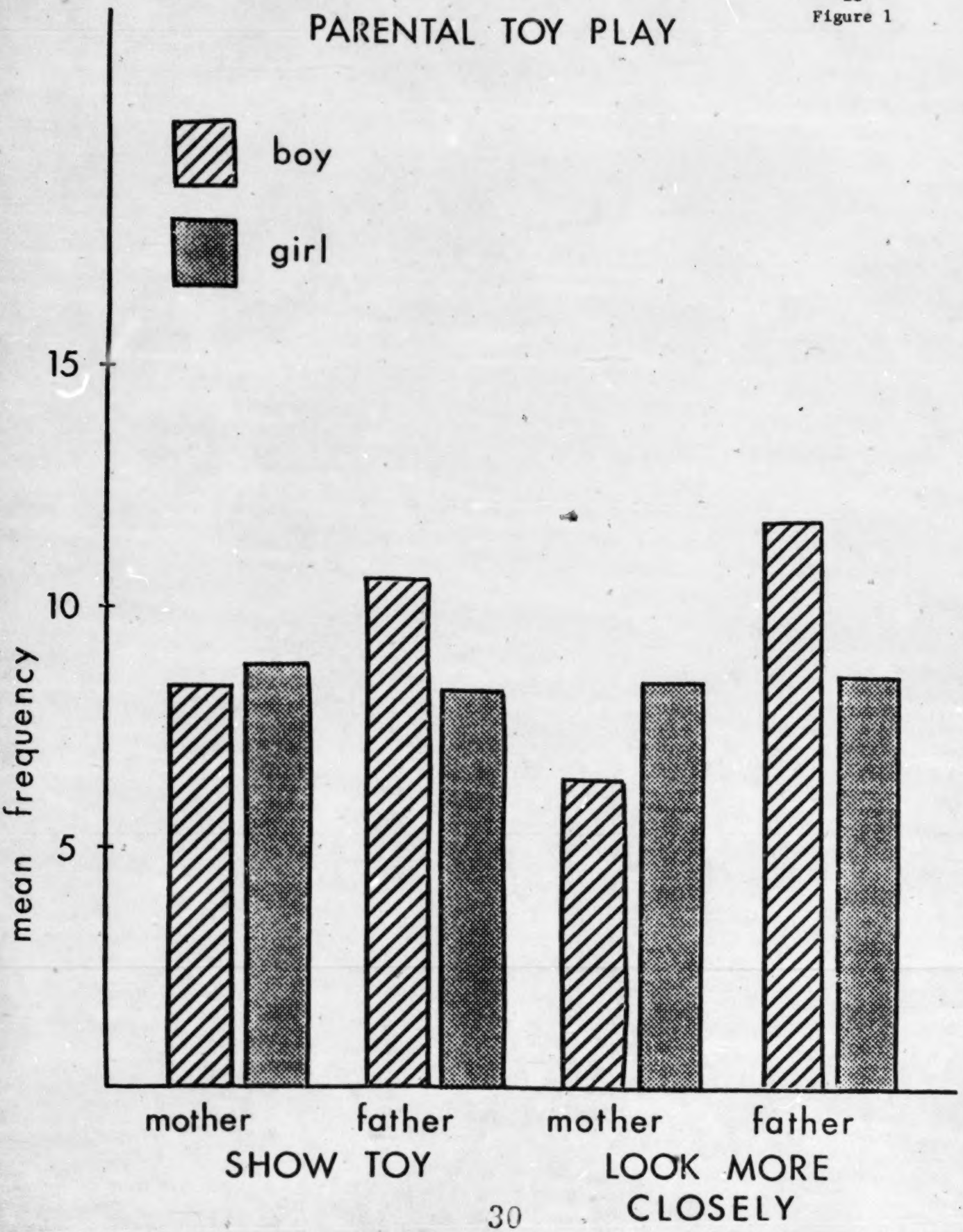
		Time Point		
		Hospital	3 Weeks	3 Months
Parent Gender	Father	264.47	238.10	255.70
	Mother	232.20	260.15	283.97

TABLE 13

MEANS FOR USES TOY OR OBJECT TO MAKE NOISE
(Frequency in Play Situation)

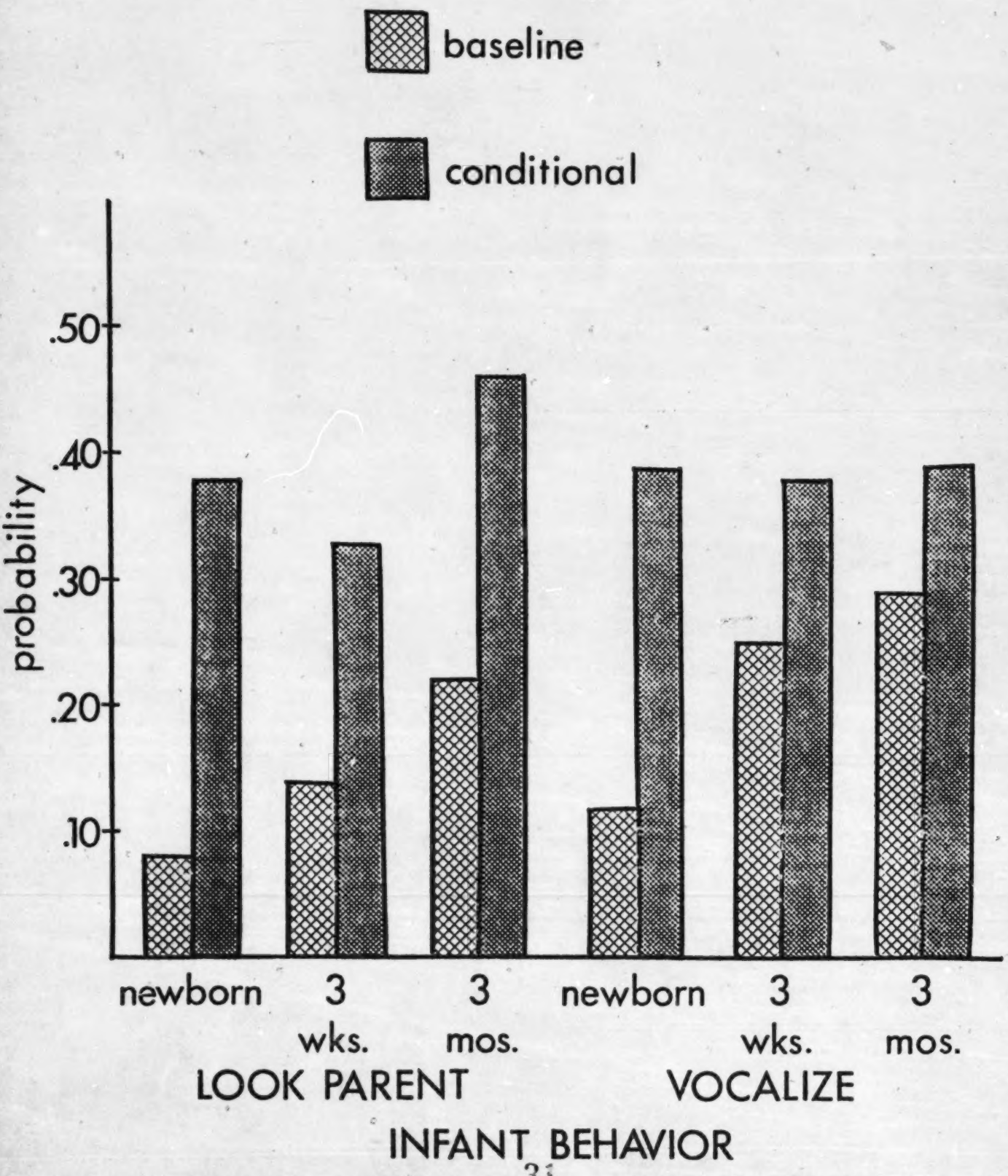
		Time Point		
		Hospital	3 Weeks	3 Months
Parent Gender	Father	30.27	27.38	27.42
	Mother	23.13	29.77	28.77

Figure 1


PARENTAL TOY PLAY
boy
girl
15
10
5
mean frequency
mother
father
mother
father
SHOW TOY
LOOK MORE CLOSELY

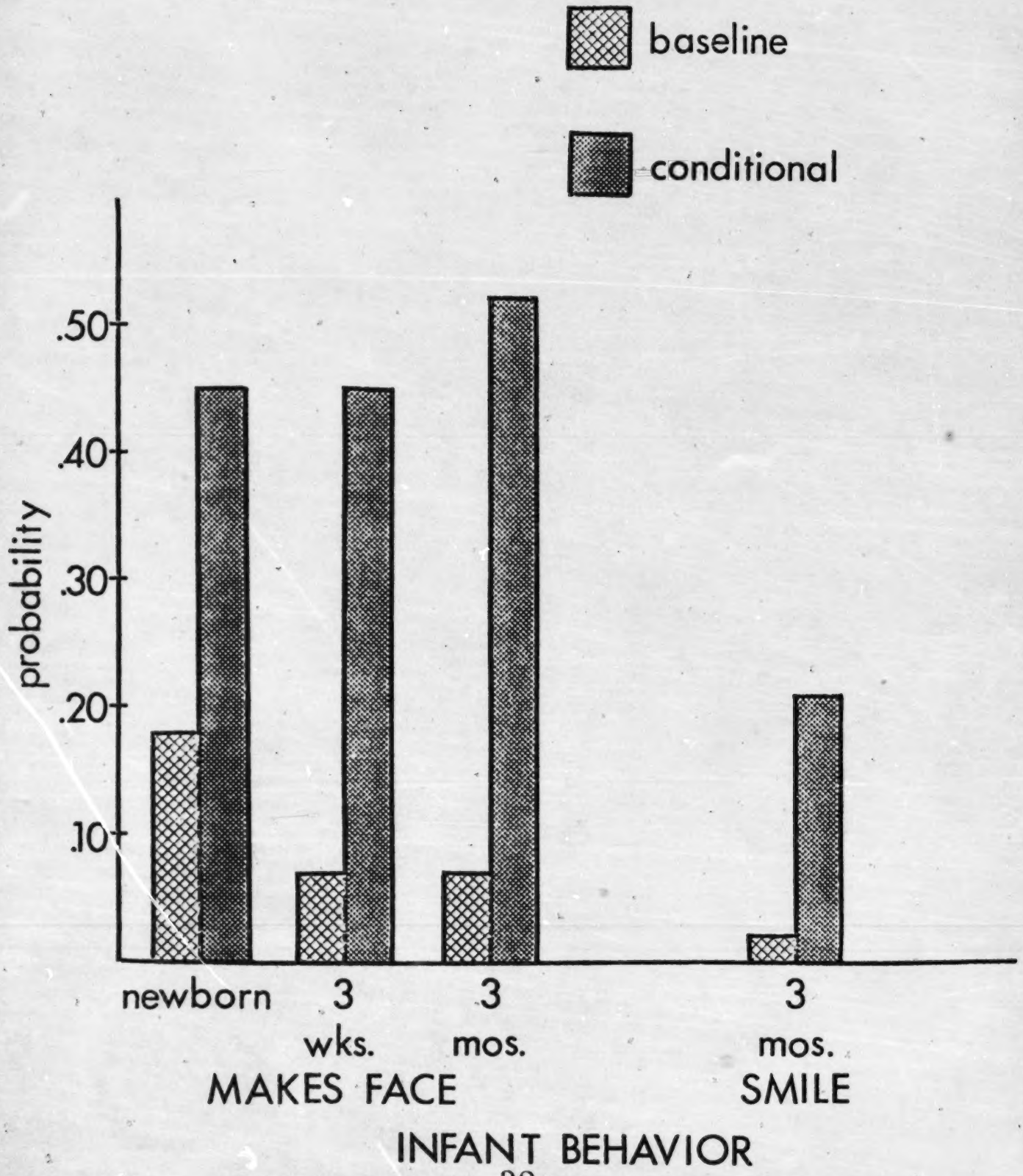
PARENTAL MODIFIER OF INFANT BEHAVIOR: VOCALIZATION

Figure 2



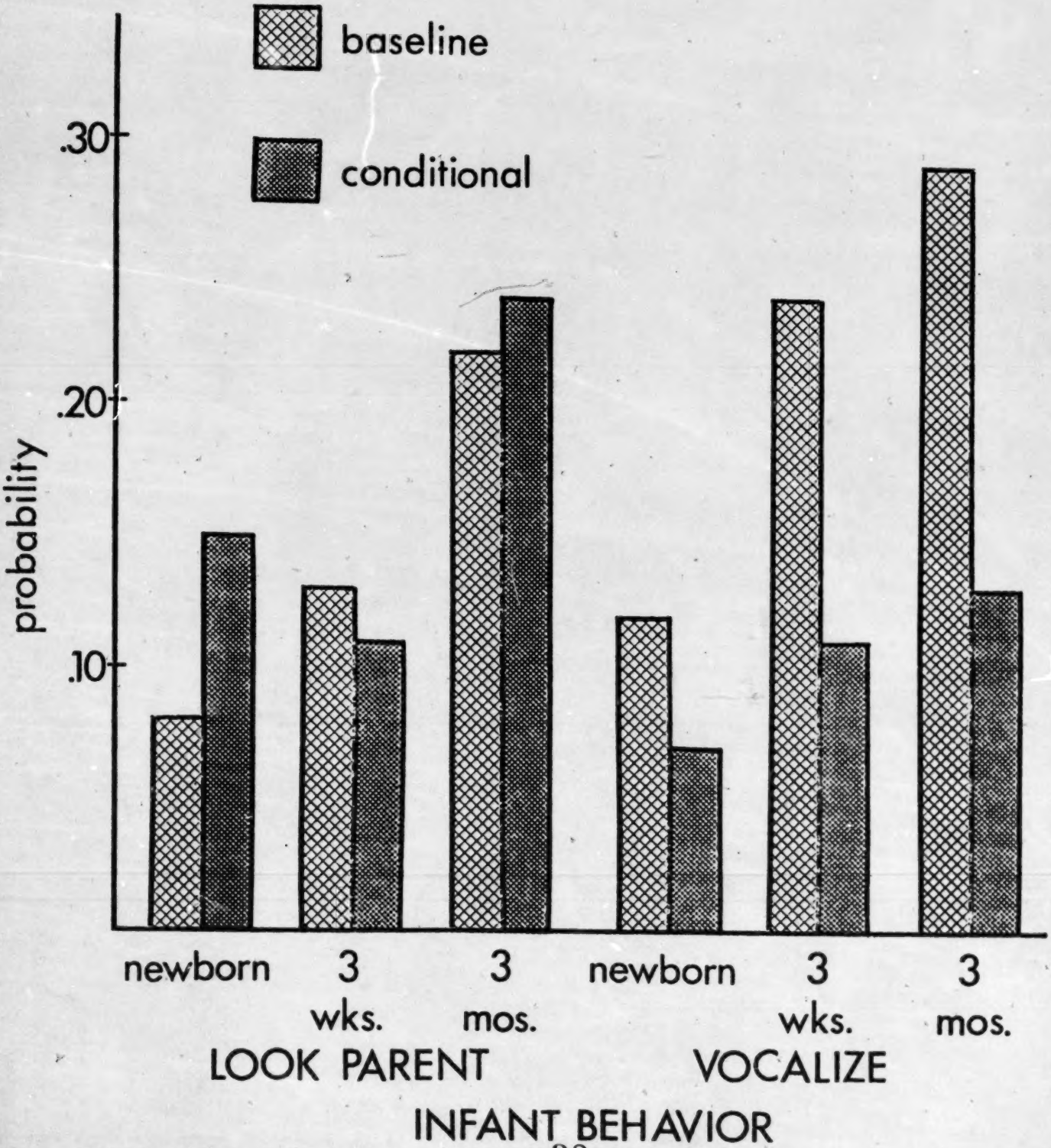
PARENTAL MODIFIER OF INFANT BEHAVIOR: VOCALIZATION

Figure 3



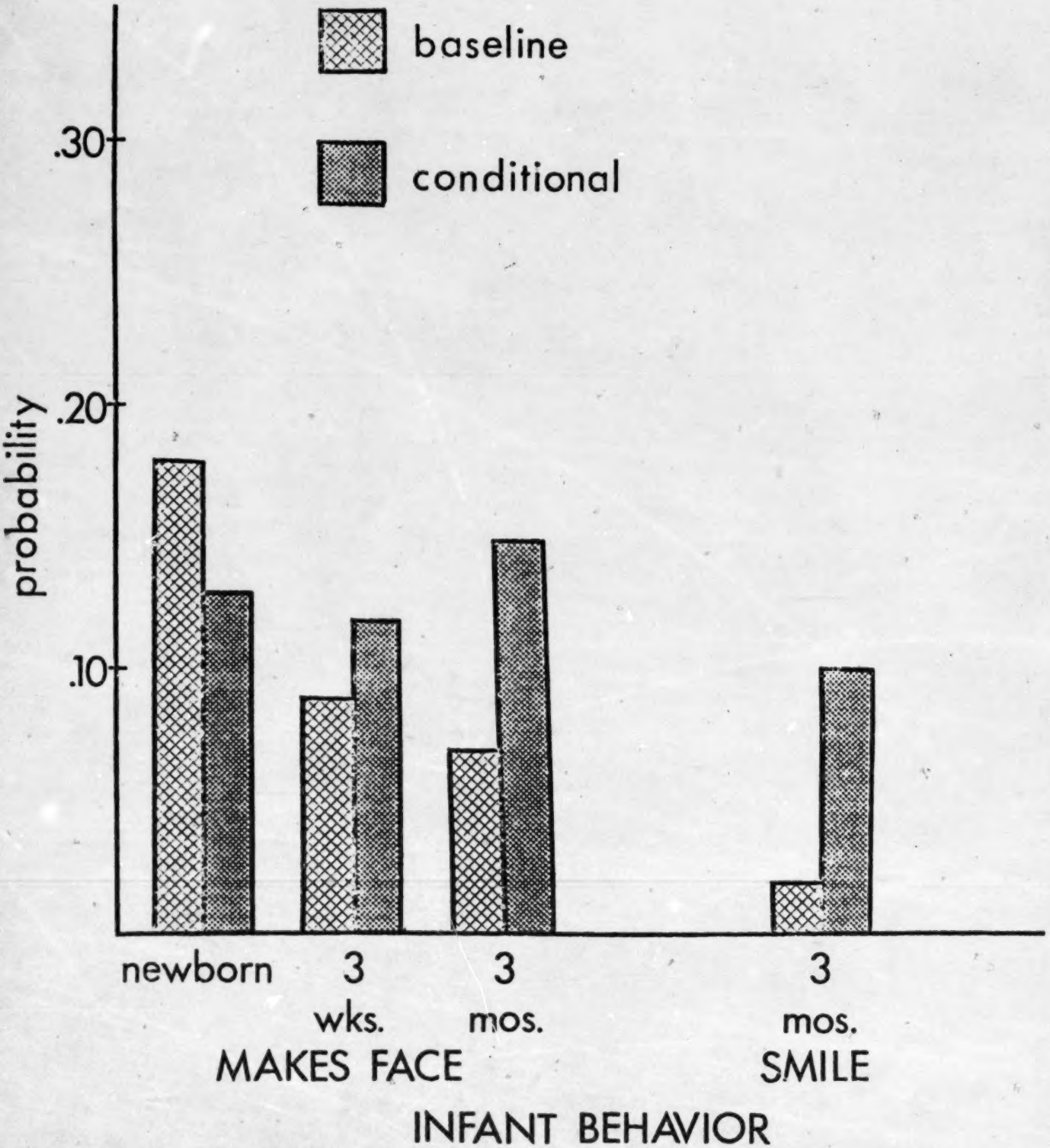
PARENTAL MODIFIER OF INFANT BEHAVIOR: SMILE

Figure 4



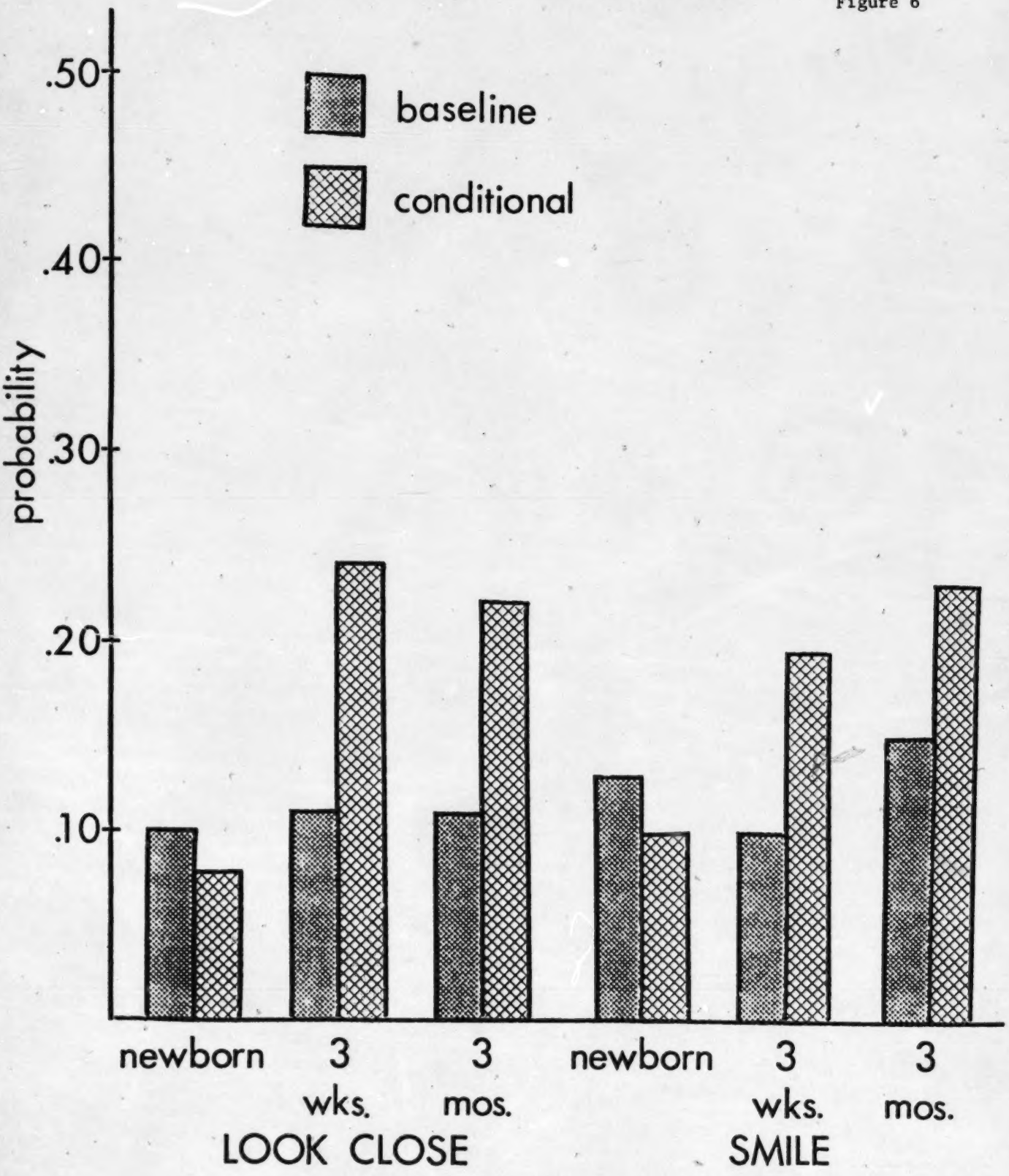
PARENTAL MODIFIER OF INFANT BEHAVIOR: SMILE

Figure 5



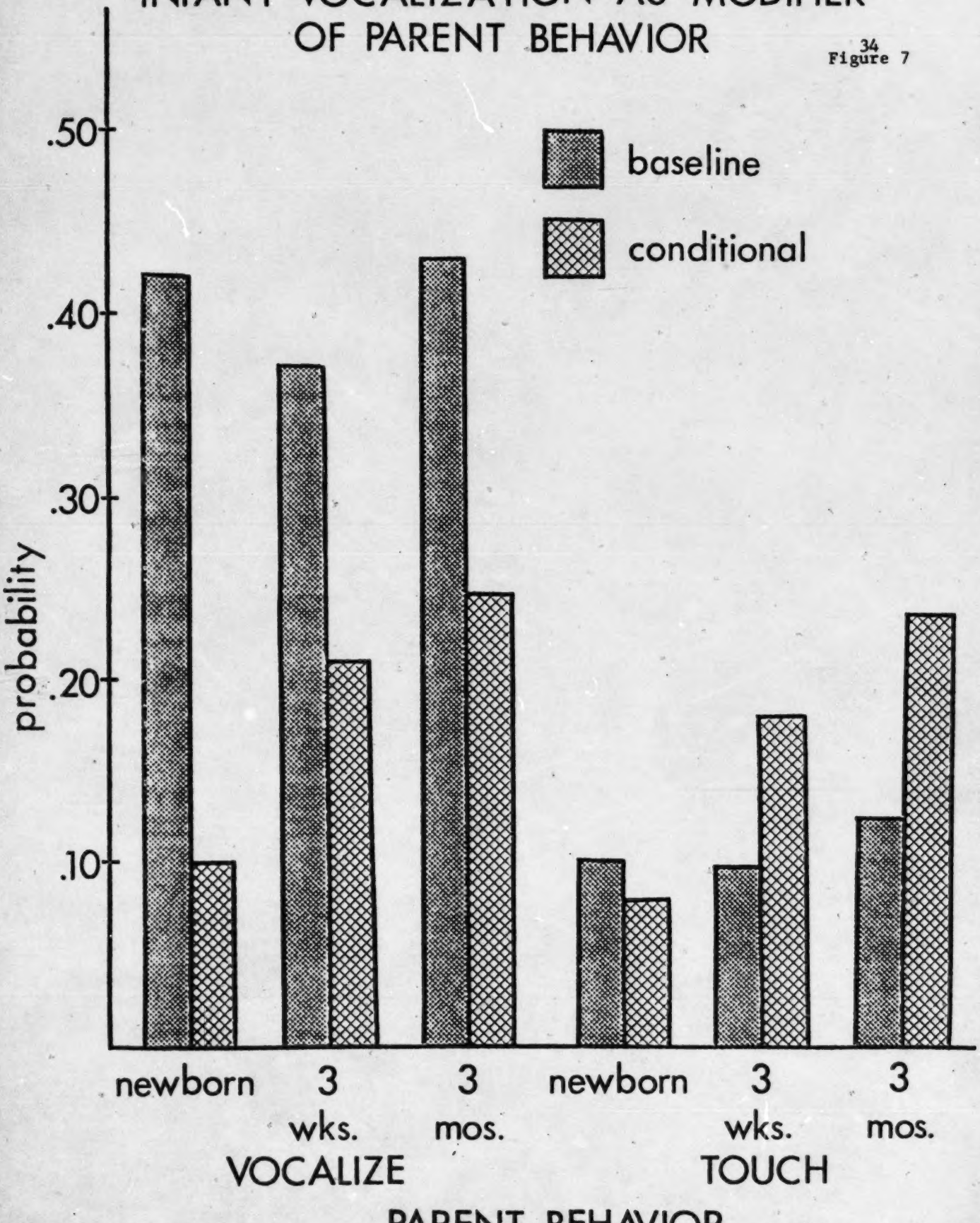
INFANT VOCALIZATION AS MODIFIER OF PARENT BEHAVIOR

Figure 6



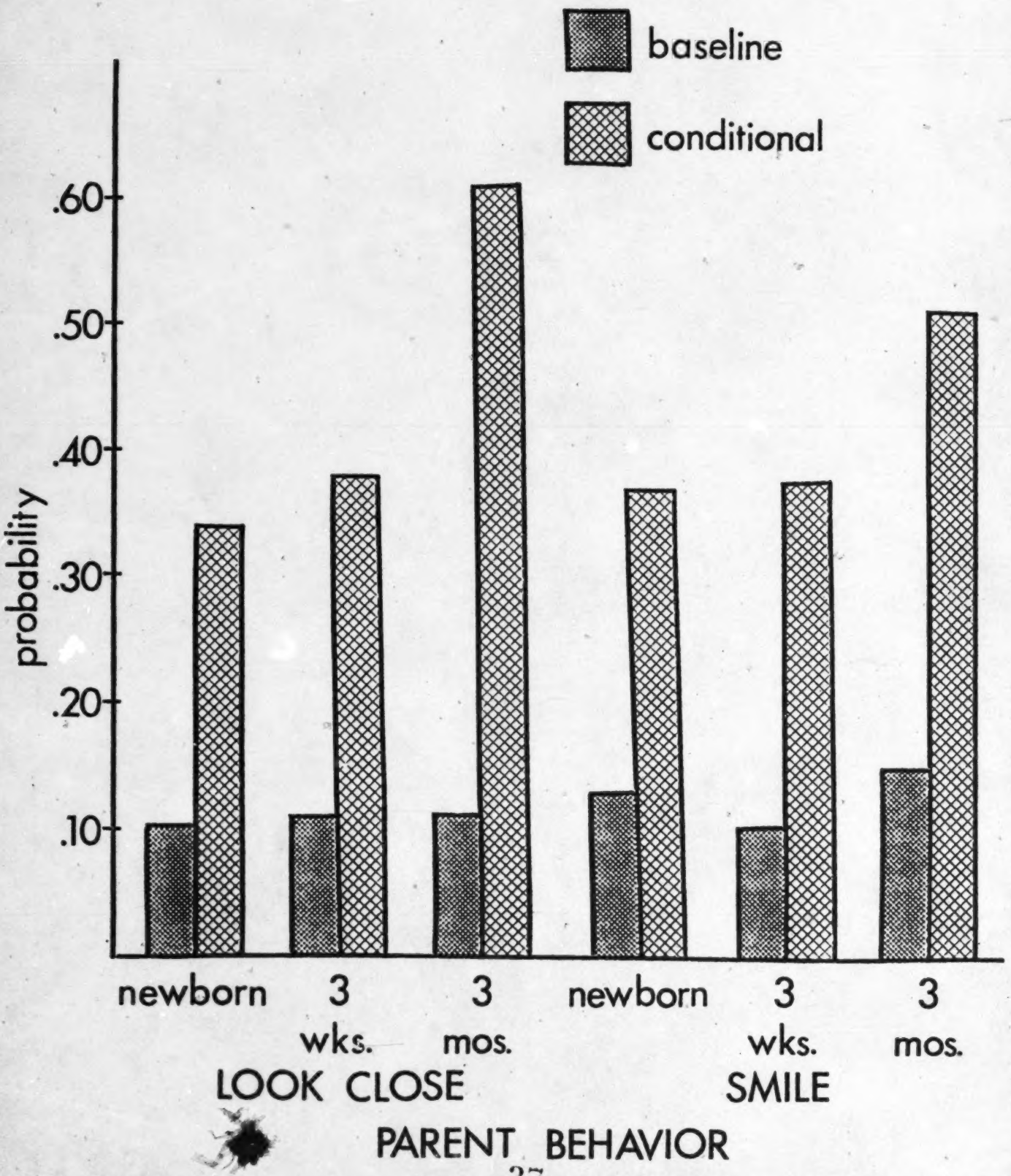
INFANT VOCALIZATION AS MODIFIER OF PARENT BEHAVIOR

34
Figure 7



INFANT MOVEMENT AS MODIFIER OF PARENT BEHAVIOR

35
Figure 8



INFANT MOVEMENT AS MODIFIER OF PARENT BEHAVIOR

Figure 9